

### Claims

1. A method of capturing operational history of an implantable medical device before, during and after detection of a fault condition for subsequent analysis to  
5 assess the cause of the fault condition, comprising:
- (a) providing an implantable, medical device having a microprocessor-based controller with a memory and a storage buffer, the storage buffer temporarily storing operational and physiologic data over a defined time interval;
  - 10 (b) detecting the occurrence of a fault condition in the operation of the implantable medical device and producing a triggering signal a predetermined time following the detection of the fault condition; and
  - (c) storing the contents of the storage buffer in the memory upon the occurrence of the triggering signal.
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2. The method of claim 1 wherein the trigger signal is produced at a time relative to the detection of the occurrence of the fault condition such that said data occurring prior to, during and after the fault condition are stored in the memory.
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3. The method of either claim 1 or claim 2 and further including the step of:
- (a) transmitting contents of the memory to an external monitor for analysis in determining a possible cause of the fault condition.
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4. The method of claim 1 wherein the defined time interval is on the order of several seconds and said predetermined time is on the order of about one-half the said time interval.

5. The method as in any one of claims 1, 2 or 4 wherein the implantable medical device is a cardiac rhythm management device, the operational data comprise event markers and the physiologic data comprise cardiac electrogram signals.

5 6. In an implantable medical device, apparatus for capturing fault history information for subsequent analysis, comprising:

(a) a microprocessor-based controller;  
(b) a sense amplifier coupled to receive cardiac electrogram signals and to deliver same to the microprocessor-based controller;

10 (c) a random access memory operatively coupled to the microprocessor-based controller;

(d) a FIFO buffer of a size capable of storing the sensed electrogram signals and event markers generated by the microprocessor-based controller over a defined time interval;

15 (e) means in the microprocessor-based controller for detecting fault conditions in the operation of the implantable medical device and producing a trigger signal a predetermined time following a detection of a fault condition;

(f) means for transferring the contents of the FIFO buffer to the random access memory upon the occurrence of the trigger signal; and

20 (g) a telemetry link controlled by the microprocessor based controller for reading out information from the random access memory to an external monitor.

7. The apparatus as in claim 6 wherein the FIFO buffer is of a size to  
25 contain said electrogram signals and event markers occurring during a time interval of several seconds.

8. The apparatus of claim 7 wherein the trigger signal is produced at a  
time following detection of a fault condition that is about one-half of said time interval.